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10/583,399

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EXAMINER

KESSLER, CHRISTOPHER S

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/583,399	Applicant(s) AHN, SOON-TAE	
	Examiner CHRISTOPHER KESSLER	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

1. Responsive to the amendment filed 15 March 2010, claim 3 is amended. Claims 1-4 are currently under examination.

Status of Previous Rejections

2. Responsive to the amendment filed 15 March 2010, the rejections of claims 1 and 2 are maintained. New grounds of rejection are presented for claims 3 and 4.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 3 and 4 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 3 requires the steps of heating steel, which contains 0.10-0.40 wt % C, 1.0 wt % or less of Si, 0.30-2.0 wt % Mn, 0.03 wt % or less of P, 0.03 wt % or less of S, and a balance of Fe and impurities, to a Ac3 transformation point or higher, without plastic deformation, so that an austenite grain size is 5-20 μm .

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However, the claimed step of heating “without plastic deformation” is not described in the instant specification at paragraph 0013 or anywhere else in the instant specification. The instant specification explicitly describes that samples according to the invention are hot rolled prior to the tempering process (see Example), and nowhere is there a mention that the heating is “without plastic deformation.”

Claim 4 is dependent on claim 3 and therefore is also not described.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by US PG Pub 2002/0040744 issued to Kanisawa et al. (hereinafter “Kanisawa”).

Regarding claim 1, Kanisawa teaches the invention as claimed. Kanisawa teaches a steel wire (in rod form) for cold forging (see p. 2). Kanisawa teaches that the wire is quenched and tempered as is known in the art, and that the prior austenite grain size should be Japanese standard JIS G 0551 size 11 or greater (see [0041]). The broad austenite grain size of Kanisawa substantially overlaps the claimed range.

More specifically, Kanisawa teaches examples of as rolled steel wire meeting the limitations as claimed. Kanisawa teaches that wire rod is heated above Ar_3 , quenched, and tempered for 30 min at 500°C (see EXAMPLE 1, and Table 2). Kanisawa teaches

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an example comprising 0.4% C, 0.24% Si, 0.68% Mn, 0.011% P, and 0.010% S (see Steel No. B, Table 1). The composition of the steel falls inside the range as claimed, anticipating the range. Applicant is further directed to MPEP 2131.03. Kanisawa teaches that the steel has a prior austenite grain size of 11.8 (or about 6 μm ; see Table 3), said size falling within the range as claimed, anticipating the range. Applicant is further directed to MPEP 2131.03. Kanisawa teaches that the steel has a tensile strength of 765 Mpa (about 78 kgf/mm^2 ; see Table 3), said size falling within the range as claimed, anticipating the range. Applicant is further directed to MPEP 2131.03.

Kanisawa does not teach that the impact absorption energy of the wire is at least 60J/cm^2 at -40°C . Kanisawa does not describe the impact absorption energy of the wire at all. However, the impact absorption energy of the wire of at least 60J/cm^2 at -40°C would have been an inherent property of the wire, because the wire had the same composition, prior austenite grain size, tempering parameter, and yield strength as claimed. The identical composition of wire processed in the same manner would have to have the same properties as the wire claimed. Applicant is further directed to MPEP 2112.01.

Regarding claim 2, Kanisawa teaches that the wire may further comprise one or more of Cr, Mo or B in the amounts as claimed (see [0052]-[0058]). More specifically, Kanisawa teaches an example of a steel wire with 0.25% C, 0.26% Si, 0.35% Mn, 0.01% P, 0.009% S and 0.0018% B (see Steel No. H, Table 1). The composition of the steel falls inside the range as claimed, anticipating the range. Applicant is further directed to MPEP 2131.03. Kanisawa teaches that the steel has a prior austenite grain

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size of 11.5 (or about 6.7 μm ; see Table 3), said size falling within the range as claimed, anticipating the range. Applicant is further directed to MPEP 2131.03. Kanisawa teaches that the steel has a tensile strength of 824 Mpa (about 84 kgf/mm^2 ; see Table 3), said size falling within the range as claimed, anticipating the range. Applicant is further directed to MPEP 2131.03.

Kanisawa does not teach that the impact absorption energy of the wire is at least 60J/cm^2 at -40°C . Kanisawa does not describe the impact absorption energy of the wire at all. However, the impact absorption energy of the wire of at least 60J/cm^2 at -40°C would have been an inherent property of the wire, because the wire had the same composition, prior austenite grain size, tempering parameter, and yield strength as claimed. The identical composition of wire processed in the same manner would have to have the same properties as the wire claimed. Applicant is further directed to MPEP 2112.01.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanisawa.

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Regarding claim 3, Kanisawa teaches the method substantially as claimed.

Kanisawa teaches a method of making a steel wire (in rod form) for cold forging (see p. 2). Kanisawa teaches that wire rod is heated above Ar_3 , quenched, and tempered for 30 min at 500°C (see EXAMPLE 1, and Table 2). Thus, the tempering parameter of the method of Kanisawa $P = 1.8 \times (500 + 273) \times (14.44 + \log 1800) = 24,621$, said parameter falling within the range as claimed, establishing a prima facie case of obviousness for that range. Applicant is further directed to MPEP 2144.05.

Kanisawa does not teach that the impact absorption energy of the wire is at least 60J/cm² at -40°C. Kanisawa does not describe the impact absorption energy of the wire at all. However, the impact absorption energy of the wire of at least 60J/cm² at -40°C would have been an inherent property of the wire, because the wire had the same composition, prior austenite grain size, tempering parameter, and yield strength as claimed. The identical composition of wire processed in the same manner would have to have the same properties as the wire claimed. Applicant is further directed to MPEP 2112.01.

Kanisawa does not teach wherein the heating step is without plastic deformation. Kanisawa teaches that the exit temperature from the hot rolling mill is within the temperature range for heating as claimed, and that the steel is laid on a conveyor and quenched in a continuous process (see Example 1 and [0063]-[0067]). However, it would have been obvious to one of ordinary skill in the art that for a batch process, the steel would have to have been cooled for safely transporting it to the quenching means, possibly resulting in a loss of the austenitic structure. It would have been obvious to

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one of ordinary skill in the art to have heated the steel in a separate step without plastic deformation, in order to have obtained the same effects in a batch process where the steel could not be quenched in the production line. Applicant is further directed to MPEP 2144.04 V.

Regarding claim 4, Kanisawa teaches that the wire may further comprise one or more of Cr, Mo or B in the amounts as claimed (see [0052]-[0058]). More specifically, Kanisawa teaches an example of a steel wire with 0.25% C, 0.26% Si, 0.35% Mn, 0.01% P, 0.009% S and 0.0018% B (see Steel No. H, Table 1). The composition of the steel falls inside the range as claimed, anticipating the range. Applicant is further directed to MPEP 2131.03. Kanisawa teaches that the steel has a prior austenite grain size of 11.5 (or about 6.7 μm ; see Table 3), said size falling within the range as claimed, anticipating the range. Applicant is further directed to MPEP 2131.03. Kanisawa teaches that the steel has a tensile strength of 824 Mpa (about 84 kgf/mm^2 ; see Table 3), said size falling within the range as claimed, anticipating the range. Applicant is further directed to MPEP 2131.03.

Response to Arguments

9. Applicant's arguments filed 15 March 2010 have been fully considered but they are not persuasive.

Applicant argues that the amendment to claim 1 is found in the specification. The examiner disagrees. Nowhere is the limitation found that the heating takes place without plastic deformation. In the Example of the instant specification, applicant

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describes that the heating step is applied to a wire that has already been hot rolled.

However, this is also not a description that the heating step is "without plastic deformation" for the invention.

Applicant argues that the limitation of claim 3 "without plastic deformation" distinguishes the claim over the prior art. The examiner disagrees. Firstly, it is unclear how applicant can reason that the limitation not found in claim 1 can distinguish claim 1 over the prior art. Secondly, In the Example of the instant specification, applicant describes that a heat treatment is applied to a wire that has already been hot rolled. In Kanisawa (as cited above), a steel matching the claimed composition is hot rolled at an exit temperature matching the heat treatment as claimed. Each steel has been hot rolled prior to the heat treatment. Thus, even if Kanisawa cannot be said to match the process as claimed, the result would have been the same.

Applicant argues that Kanisawa does not teach the claimed tempering parameter. The examiner disagrees because applicant's statement is incorrect. The case law as well as the MPEP are explicit on this matter; in order to anticipate (or make obvious) a claimed range, the reference does not have to teach the entire range. applicant is directed to MPEP 2131.03 and 2144.05. It is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, *Taklatwalla v. Marburg*, 620 O.G. 685, 1949 C.D. 77, and *In re Pilling*, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In the absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by

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those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. In the instant case, Kanisawa as cited above clearly describes a process with a tempering parameter P as claimed (see rejection of claim 3). The fact that Kanisawa does not describe the full formula as claimed is not sufficient to distinguish the claim over the prior art.

Applicant argues that Kanisawa does not solve the same industrial problem solved by applicant's invention. However, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Applicant states that the wire of Kanisawa after tempering but before spheroidization treatment shows similar mechanical properties to the instantly claimed wire, but that it cannot be used for cold forging. The examiner agrees that the wire of Kanisawa after tempering but before spheroidization shows the same properties as claimed. Indeed, it is this aspect of Kanisawa that is relied upon in the rejection; Kanisawa teaches the same wire as claimed in claims 1-2. The teaching of Kanisawa that the wire is further processed (e.g., spheroidized after the tempering) does not negate the fact that the wire has the same strength as claimed, nor does it negate the fact that the wire is "for cold forging" as claimed. The examiner notes that the rejection of claims 1 and 2 is an anticipation rejection.

Applicant claims that the cold impact resistance properties of the wire of Kanisawa would not have matched the claimed properties. However, applicant has shown no evidence of this, only arguments. Applicant states that the wire of Kanisawa

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requires more ductility than it has if it is to be used for cold forging. Applicant further states in the remarks of 15 March 2010 at p. 7,

In summary, Kanisawa only achieves applicants' claimed tensile strength when it has an impact absorption energy lower than applicants' claimed range of at least 60 J/cm² at - 40°C, and Kanisawa only achieves applicants' claimed impact absorption energy when it has a tensile strength lower than applicants' claimed range of 70 - 130 kgf/mm².

However, applicant has provided no data to this effect, only argument. Indeed, Kanisawa does not describe either of the ductility of the wire, or its cold impact resistance. Yet applicant says that these properties of the wire are outside the claimed range.

The declaration under 37 CFR 1.132 filed 15 March 2010 is insufficient to overcome the rejection of claims 1-2 based upon Kanisawa as set forth in the last Office action because: the examiner disagrees with applicant about what the prior art reference teaches, and therefore disagrees with applicant's conclusions about the prior art. Applicant states that Kanisawa teaches away from the process of claim 3. However, the teaching of Kanisawa of another way of making steel wire is not a teaching away from applicant's invention. Applicant states that Kanisawa does not teach the claimed tempering parameter. However, as stated above, this statement is simply incorrect. Kanisawa need not describe the claimed range, or even the claimed formula verbatim in order to either anticipate or make obvious the claimed parameter. Even though Kanisawa does not describe applicant's claimed formula for P or describe the value of P explicitly, the processing of Kanisawa still meets the limitations of the claim. Applicant states that the material of Kanisawa after tempering cannot be applied

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to cold forging (without the subsequent spheroidization treatment). However, applicant has provided no data to support this statement. Kanisawa teaches that a steel wire with the same composition as claimed and the same prior austenite grain size as claimed is subjected to a tempering treatment with the same tempering parameter as claimed. Yet applicant states that this would not have yielded the same results in terms of mechanical properties, because Kanisawa teaches that the wire is hot rolled in the same step as the heating. The examiner disagrees with this statement. Applicant's specification shows that the wire is hot rolled prior to heating, which seems to be the standard method of ingot breakdown to form the wire.

Applicant states in the declaration at p. 6 that the method of Kanisawa of quenching after the hot rolling step would have yielded different results due to the stress in the steel. However, the examiner disagrees with this statement for several reasons. Firstly, the instant specification teaches that the steel is hot rolled and then heated, quenched and tempered (see EXAMPLE), and there is no teaching whatsoever of a stress-relieving anneal, or of any cooling step after the hot rolling. Thus the examiner believes that applicant's statements are not consistent with what is taught in the instant specification, and that the steel produced by the method of Kanisawa is the same as the steel claimed in claims 1 and 2. Secondly, one of ordinary skill in the art would recognize that at the hot rolling exit temperature of Kanisawa, dynamic recovery and/or dynamic recrystallization would take place in the steel (i.e., it is "hot" rolling). Kanisawa teaches that the steel is placed on a conveyor in the form of rings (see Example 1), thus providing time for dynamic recovery and/or dynamic recrystallization. Thirdly, applicant

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has provided no actual data that the steel of Kanisawa prior to spheroidizing treatment would not have had the claimed properties, only arguments in the declaration.

Applicant further argues that "Kanisawa acknowledges that the wire must be further spheroidized annealed before it is capable of being cold forged." The examiner disagrees with this characterization of the steel wire of Kanisawa. Nowhere does Kanisawa make such a statement. The examiner acknowledges that the goal of the invention of Kanisawa is to create a steel that is capable of being spheroidized without a drawing step prior to spheroidization, in order to simplify the processing in the conventional manner. However, the aim of Kanisawa does not change the facts that the steel of Kanisawa in the as-tempered state (before spheroidizing) has the same strength and composition as claimed, the same tempering parameter as claimed, and the same prior austenite grain size. Additionally, the claim element "for cold forging" is a statement of intended use, and does not define any particular structure in the wire. Further, the teaching of Kanisawa that the wire is spheroidized prior to cold forging meets the limitations of a wire "for cold forging" in the as-tempered state.

Based on the lack of any data to support applicant's conclusions, and the lack of veracity of the incorrect statements made about the prior art, applicant has not shown that the invention of claims 1 and 2 is distinct from that of Kanisawa. With regards to the new rejection of claims 3 and 4 under section 103, based on the lack of any data to support applicant's conclusions, the incorrect statements made about the prior art, and the statements inconsistent with applicant's specification, the evidence of obviousness outweighs the evidence of non-obviousness.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER KESSLER whose telephone number is (571)272-6510. The examiner can normally be reached on Mon-Fri, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Roy King/
Supervisory Patent Examiner, Art
Unit 1793

csk